

Allelopathic Effect of *Gymnema Sylvestre* (Retz.) Leaf Leachates on Germination And Growth of *Trigonella-Foenum Garecum* L.C.V.Lam Selection-1

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Introduction:

The presence of neighbouring plants species can have a significant influence on seed germination, growth and yield of crop plant (Rice, 1974). Olofsdotter *et. al.* (1995) stated that, the Allelopathy as the direct influence of chemicals released from one living plant on the development and growth of another plant. Putnam (1985) described the phenomenon of auto toxicity as a special form of Allelopathy that occur when chemical substances released from one plant inhibit or delay germination and growth of same or different plant species.

The influence may be either positive or negative depending upon the nature of allelochemical released by the Allelopathic plants. Such Allelopathic effect will become more prominent to future agricultural systems.

In the present investigation deals with the study of significant Allelopathic effects of *Gymnema sylvestre* (Retz.) leaf leachates on the germination and growth of *Trigonella foenum-graecum* L. c.v.Lam selection-01

During the experimental period Environmental temperature of Konkan region ranging from 10^oC to 34.87^oC and Relative humidity at morning period ranging from 87% to 98%.it was maximum during monsoon and decreased during post monsoon period weather condition prevailing during experimental period.

Key Words: Allelopathy, *Gymnema sylvestre* (Retz.) , Konkan.

Material and Method:

During the month of September to October, fully growth matured green leaf samples were collected from Kudavle forest area. It is 15 km away from Dapoli tahasil. The collected leaf samples are brought in the laboratory. Then these samples were dried first at 60 °C for two days and thereafter at 80 °C for two days. These dried leaves were grind through two mesh size by electrical grinder to make fine powder. One hundred grams leaf powder of selected plant species were soaked in conical flask containing 200 ml distilled water for 24 hours.

The leaf leachates were filtered and the filtrate made up 200 ml volume by using distilled water. Which were considered as 100% and then diluted with distilled water and prepare solution like as-

T ₀	-	Control Tap water.
T ₁	-	20 % leachates
T ₂	-	40 % leachates
T ₃	-	60 % leachates
T ₄	-	80 % leachates
T ₅	-	100 % leachates

The treatment was replicated four times by using R. B. D. design.

Trigonella foenum -graecum L. seeds were treated with 0.1% mercuric chloride and washed thrice with distilled water and dried on sterile absorbent paper to avoid fungal attack. Twenty five seeds of *Trigonella foenum-graecum* L. were tested for germination in 90 mm diameter petridishes containing germinating paper saturated with above concentration of leaf leachates. The moistened petridishes was maintained by adding 2.5 ml leaf leachates solutions.

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The percentage of germination, root and shoot length and biomass production of the seedling was recorded after 3 DAS, 4DAS,5DAS,6DAS and 7 Days after sowing.

Data were subjected to statistical analysis for estimating allelopathic effect of different concentration of leachates of forest plant on the field crops. The value of the germination percentage was firstly converted to respective ARAC-SIN value. These ARC-SIN values were used for statistical analysis. The standard error and critical difference were calculated by following method prescribed by Panse and Sukhatme (1995).

Result And Discussion:

The different treatment of leaf leachates of various concentrations are significantly affected on germination percentage of *Trigonella foenum-graecum* L at all the stages.the germination percentage,radical length ,plumule length was decreased progressively with increase in the concentration of leaf leachates of aqueous solutions .it is depicted in Table No. 1

Effect of different concentration of *Gymnema sylvestre* (Rez.) leaf leachates on germination and growth of *Trigonella foenum -graecum* L. (Note:Figure in the parentheses indicates ARC-SIN Values.)

Treatment	Germination % Days after soaking					Length of Radicle(cm) Days after soaking					Length of plumule(cm) Days after soaking				
	3	4	5	6	7	3	4	5	6	7	3	4	5	6	7
T ₀ control	75.00 (60.00)	80.00 (63.43)	80.00 (63.43)	80.00 (63.43)	80.00 (63.43)	1.2	1.6	2.066	2.19	2.46	-	1.16	1.50	2.00	2.43
T ₁ (20%)	53.33 (46.90)	60.00 (50.76)	61.66 (51.74)	61.66 (51.74)	61.66 (51.74)	0.93	1.33	1.66	1.72	2.16	-	0.83	1.33	1.66	2.10
T ₂ (40%)	40.00 (39.23)	50.00 (45.00)	50.00 (45.00)	50.00 (45.00)	50.00 (45.00)	0.76	1.06	1.50	1.25	1.73	-	0.63	1.13	1.43	1.76
T ₃ (60%)	33.33 (31.08)	38.33 (31.08)	38.33 (31.08)	38.33 (31.08)	38.33 (31.08)	0.56	0.83	1.06	1.56	1.33	-	0.40	0.86	1.20	1.50
T ₄ (80%)	26.66 (31.08)	26.66 (31.08)	26.66 (31.08)	26.66 (31.08)	26.66 (31.08)	0.26	0.66	0.86	1.17	1.10	-	0.30	0.70	0.93	1.13
T ₅ (100%)	13.33 (21.41)	20.00 (26.56)	20.00 (26.56)	20.00 (26.56)	20.00 (26.56)	0.10	0.26	0.53	0.60	0.60	-	0.20	0.40	0.50	0.70
SE ± =	1.360	1.581	1.721	1.721	1.721	1.477	0.0291	0.0421	1.169	0.0849	-	0.0227	0.0227	0.291	0.059
CD at 5%	4.284	4.980	5.421	5.421	5.421	NS	0.0916	0.1326	0.233	0.2674	-	0.0715	0.730	0.916	0.186

Similar results were also observed by Gayner (1992), when he studied the effect of different leachates of different tree species on germination of rice and cowpea. The germination of rice was moderately affected with the leaf leachates of *Tectona grandis* L. (Jadhav and Gaynar, 1994), *Casuarina equisetifolia* (Jadhav and

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Gaynar, 1995). They observed that the germination of rice was above 80 % in leaf leachates obtained after soaking the teak leaves for 24 Hrs.

Melkania (1984) showed the different leaf leachates obtained from different tree species affected differentially the germination of different agricultural crops. Maximum inhibition was recorded for *Scalaria italica* than treated with *C. australis* and *G. Optiva* leachats. The germination of *Glycin soia* seed was inhibited when treated with *C. Austria*. Germination of *Echinochloa frumentacea* and *Elusine coracana* was least inhibited. Bhatia and *et.al.* (2005) observed the germination percentage of wheat decreased with the increase in rice straw leachates concentration as compared to control.

Rai and Tripathi (1982), reported the leaf leachates from *Eupatorium riparium* Regel. significantly inhibited the radical and plumule length of *E.adenophorum* and *Trifolium repens*. Rao and *et.al.* (1977) reported that aqueous extract of dry leaves of *Parthenium hysterophrus* L.inhibit the dry weight of plumule and radicals of *Triticum vulgare* L.

From above, similar line of our observations. It was concluded that 100% leaf leachates at 7DAS decreases germination percentage, root and shoot length i.e. 20%,0.60 cm, and 0.70 cm followed by 80%,60%,40% and 2% leaf extract respectively as shown in the above Table No.1.

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